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PROCESS AND DEVICE FOR ASSESSING FEES FOR THE USE OF A  
TELECOMMUNICATIONS NETWORK  
[Verfahren und Vorrichtung zum Erheben von Gebühren für die Nutzung  
eines Telekommunikationsnetzes]

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The invention relates to a process, as well as a device for assessing fees for the use of a telecommunications network, particularly, of a mobile radio network, with a telecommunications device, whereas the telecommunications device includes a storage system for fee-relevant information, especially, concerning the amount of money which is available for use.

A process, as well as a device of the type discussed have been known to the art in practice for an extended period of time. The device known to the art, as well as the process known to the art are, for instance, used in public telecommunications devices in the form of telephones in which the assessment of fees for the use of the connected telecommunications system occurs through so-called calling cards. Such calling cards constitute a storage system for fee-relevant information, i.e., specifically, the information concerning the amount of money which is available for use.

The calling cards known to the art which serve as a storage system for fee-relevant information can be obtained at various sales locations and facilitate the use of a telecommunications network within the scope of the predefined card value. During the use of the telecommunications system within the framework of, for instance, a voice connection, the card value is reduced according to the fees which are incurred as a result of this use.

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\*Number in the margin indicates pagination in the foreign text.

The problem in the processes known to the art, and in the device known to the art, is that the calling cards known to the art cannot be used any further after the card value has been used up and must, possibly, be disposed off. They are quasi disposable cards. Apart from the fact that such a disposable system is harmful to the environment, the great disadvantage which results for a user who requires a large reserve for use is that he must carry several calling cards with him to provide a high reserve for his use. This is highly impractical and substantially impairs flexibility with regard to the use of the pertinent telecommunications network, so that the device known to the art, as well as the process known to the art, also pose a situation for the network operator which inhibits sales and is thus economically unfavorable.

Therefore, the present invention is based on the objective of providing a process, as well as a device of the kind mentioned at the beginning of the text whereby an environmentally friendly and flexible use of a telecommunications network is realized with simple means.

In accordance with the invention, the above objective with regard to a process for assessing fees for the use of a telecommunications network of the type discussed is realized through the characteristic features of Patent Claim 1. Accordingly, the process being discussed is configured, so that, at

least, the information pertaining to the amount of money prior to and/or during and/or after use can be changed.

In a manner that is in accordance with the invention, it has been recognized that the option of changing the information concerning the monetary amount realizes the above objective in a surprisingly simple fashion. By changing this information, the available amount of money, especially, can be increased in an appropriate way. If the user finds that the amount of money will not suffice for the intended use, for instance, before the use, /2 he can preset the conditions required for the intended use in advance by changing the amount of money. Likewise, it is also possible to change the information concerning the amount of money during and/or after use. If, for instance, after use by the user, it is found that the amount of money amount is extremely low and will, possibly, be insufficient for further use, he can change the information concerning the monetary amount immediately after use in such a way that the conditions required for a further use will be present with regard to the amount of money.

Due to the changeability of the information concerning the amount of money in accordance with the invention, it further is possible to use the available storage system, for instance, a calling card, multiple times, whereby harm to the environment due to the disposal of used up calling cards known to the art is avoided. The carrying of multiple calling cards to ensure that the

required conditions are met with regard to a high reserve for use is no longer necessary.

With this, an extremely high amount of flexibility results for the user of the telecommunications network with regard to the use of the telecommunications network. Moreover, an obstacle to sales and, thus, an economically disadvantageous situation is eliminated for a network operator.

As a consequence, a process is provided with the process in accordance with the invention whereby an environmentally friendly and flexible use of a telecommunications network is achieved with simple means.

In view of a maximum possible content of information, the information of this kind of telecommunications use may include the telecommunications distance, the duration of use, the time of use, the current fee tariff and/or the utilization fees which are incurred during the use. Thereby, a comprehensive control option is provided for the telecommunications activities of the user. In this process, all information could be changed prior to, and/or during, and/or after use - automatically, depending upon the requirements.

The information could also include the user identification, for instance, the name and/or customer number and/or bank connection, for instance, the name of the banking institution, the bank code, and the account number, and/or the user's credit standing criteria, for instance, his credit worthiness, or a credit

limit for the amount of money which is available for use, and/or accumulated revenues for the use, or a use profile over a certain period.

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To guarantee a particularly convenient process, the amount of money could be continually reduced during the use according to the way in which the telecommunications are used, and/or the distance of the telecommunications, and/or the duration of the use, and/or the currently applicable fee tariff. For this purpose, the respective information already stored would be read out from the storage system prior to the use and would be read into the storage system during the use. This would result in a quasi constant reading and writing process by the telecommunications device, or by an assigned write-read-unit.

When falling below a predefinable monetary amount, the use could be stopped to guarantee an accurate assessment and /3 accounting of the fees. Other fee-relevant information could also be used for such a stoppage. After all, the behavior of the telecommunications system is controlled via the fee-relevant information. The predefinable amount of money could be zero in a particularly simple manner.

The use could also be stopped after the use incurred during a predefinable period, in particular, over one month, was exceeded. With this, a retroactive payment of fees would be possible if a credit limit according to the predefinable period and, possibly, with respect to the available monetary amount, were present.

Depending upon the requirements, or peripheral parameters which are preset by the individual telecommunications device, the storage system could work electronically and/or magnetically and/or optically.

In a particularly compact configuration of the invention the storage system could be integrated in the telecommunications device. In view of a particularly flexible change of the information, the storage system might be extractable from the telecommunications device, or detachable from it and might subsequently be supplied to a device which would facilitate a change of the information. With regard to a simple triggering of the storage system, the storage system could be integrated in a microprocessor. In this context, it would also be conceivable that the storage system is a microprocesor itself.

In a particularly simple and multi-faceted configuration, the changing of the information could occur via a separate information carrier which could be linked in communication with the storage system. In this process, the information carrier could be conditioned in such a way that a flow of information will take place with the storage system immediately when the communication with the storage system is established. In addition, the information could also be read out from the storage system via the information carrier. In this process, it would be possible to display information stored in the storage system via an appropriate device - for instance, a display terminal, and then, in turn, to



condition or manipulate the information carrier in the manner desired.

In view of an especially cost-effective configuration, the information carrier could be a chip card and/or a magnetic strip card. Depending upon the requirements, the information carrier could also work optically.

In order to achieve a particularly high degree of universality, and in view of an especially simple construction of the telecommunications device, the storage system could be a chip card and/or a magnetic strip card. Such a storage system configured as a chip card and/or magnetic strip card could be provided in addition to a separate information carrier, or it could serve as an information carrier of the above-described kind itself.

In principle, the processing of the information could be carried out in a microprocessor. This microprocessor could then also be used as an information carrier of the above kind. If a chip card was used as a storage system, and/or as an information /4 carrier, the chip card could be the "clearing card" if the process was used in a mobile radio network, or it could be the network card of the respective mobile radio network. With that, the user would have the network card, the storage system, and/or the information carrier integrated in one card in a universal manner. The information carrier and/or the storage system could additionally or alternatively be integrated in a credit card - possibly, with a network card function. The integration in cash cards, automatic

teller machine cards, calling cards, or PIN cards of any type would also be conceivable.

In a particularly flexible way, the information carrier, and/or the storage system could be exchangeable for information carriers or storage systems of the same kind. With that, it would be guaranteed that various users could, respectively, use their own information carriers and/or their own storage systems if, for instance, only one single telephone communications device was available. Thus, an assessment or accounting of fees assigned to the respective user would be an option.

The exchangeability of the information carriers and/or storage systems also facilitates a retroactive purchase of additional information carriers and/or storage systems of the same kind for a continued use of telephone communications. With that, a payment of fees by cash through the use of cash would be possible. With that, the acquisition of individuals who do not have legal capacity or are not credit-worthy would then be made possible.

In principle, it should be noted that fee-relevant information can be filed or posted on the information carrier and/or the storage system in any manner desired. This process can take place as often as desired.

In view of a particularly simple changing of the information, especially, with regard to the monetary amount, the change of the information could occur in the information carrier and/or the storage system by means of a write-read unit which would

communicate with a financial institution. A cashless fee payment settlement for the use of a telecommunications network would thereby be realized. In a manner which, furthermore, would be very simple, the write-read unit could be an automatic teller machine of the type which has been known to the art and has been used for a long time for withdrawing cash, or to conduct various queries with regard to account data.

In an especially practical manner, the write-read unit could be integrated in the telecommunications device, or could be assigned to it. In this context, an attachable module with a card slot would be conceivable. With this the information could be changed directly via a telecommunications connection with a financial institution by means of the telecommunications device. A simple loading of the storage system with regard to the amount of money available for use could thereby be achieved.

Depending upon the requirements or storage system used, the write-read unit could work electronically and/or magnetically and/or optically. To guarantee a repairman-friendly setup of the telecommunications device, the write-read unit could be extractable from the telecommunications device, or be detachable from it.

In principle, it remains to be noted that the payment of fees for the use of a telecommunications network can be made by a user himself in a flexible manner. To carry out the process, on the one hand, the telecommunications network operator could be designated as the subscriber, as well as institutions or financial

institutions responsible for the settlement of payments for the use, but third parties, could also be designated.

The payment of the fees by the user himself in the form of a transfer or exchange of information from the telecommunications device to a financial institution or an appropriate office handling the payment, or also the acquisition of the card by cash payment, or through a charge against available assets in an account provides a substantial cost savings for the network operator because no elaborate centralized assessment process is necessary any more. Regardless of this, fee information in the form of, for instance, counted fee cycles or fee units of a telephone connection that have already been calculated could also be transferred to the network operator. This information could then be used for control purposes with regard to the payments that have been made by the user.

With regard to a multi-faceted range of use for the process provided, the telecommunications network could also be a decentrally organized network. This type of network which, for instance, is comprised of individual mobile radio communications terminals as well as a mobile radio relay, is described in the German patent application 19535021.9 which goes back to the Applicant. With this type of telecommunications network, it is essential that the network is not operated through a central operator location, but that it is operated completely decentralized via the telecommunications devices which act as the terminals and the relay. In decentrally organized networks, the assessment of

fees specifically does not occur in a central process computer, but instead, it occurs directly within the telecommunications device. Thus, no telecommunications connection and no central network administration exist between a central office and the telecommunications devices. The fee-relevant information is generated or assessed decentrally by the telecommunications device. Every accounting process is carried out directly and decentrally via the respective telecommunications device which may, for instance, be a user terminal.

With regard to a device, the above objective is realized by means of the characteristics of Patent Claim 28. In accordance to it, the device in question is configured in such a way that, at least, the information which relates to the amount of money can be changed prior to and/or during and/or after use.

Even a device of this type can be used in a decentrally organized telecommunications network. Then, when the telecommunications are used, for instance, the telecommunications device - for instance, a subscriber terminal - registers the fee-relevant information and writes this information into the storage system after and/or during the use of the terminal. With each new use, the terminal reads out the previously accumulated fee-relevant information and automatically stops any further use as soon as a certain use level has been reached, or if a predefinable amount of money is not reached. The assessment of fees is then not carried

out via a central process computer of a centrally organized network, but instead occurs directly via the telecommunications device or via the user who has changed the information concerning /6 the monetary amount in the storage system before the use. In this process, it is essential that an appropriate fee amount must have been paid before telecommunications are used, so that a use can occur. This provides the network operator with increased security with regard to the collectibility of the fees because the network operator does not have to provide his service in the form of network access first and subsequently receives the fees for this, but receives the fees first the other way around.

The information could especially control the behavior of the subscriber interfaces and the relais behavior of these devices in a decentrally organized telecommunications network of the above-described type.

To simply change the information, particularly, concerning the amount of the money still available for use, the write-read unit storing the information in the storage system, or reading them out from it, could be the same write-read unit that can communicate with a financial institution.

In conclusion, it should be emphasized most particularly that the process in accordance with the invention, as well as the device in accordance with the invention for the assessment of fees for the use of a telecommunications network can be used both in a

traditional, centrally organized telecommunications network, and in a decentrally organized telecommunications network.

#### Patent Claims

1. Process for the assessment of fees for the use of a telecommunications network, especially, of a mobile radio network, with a telecommunications device, whereas the telecommunications device includes a storage system for fee-relevant information, especially, concerning the monetary amount which is available for the use, characterized in that, at least, the information pertaining to the monetary amount can be changed prior to and/or during and/or after the use.
2. Process, in accordance with Claim 1, characterized in that the information includes the type of the telecommunications use, the telecommunications distance, the duration of use, the time of use, the current fee tariff and/or the usage fees which are incurred during the use.
3. Process, in accordance with Claim 1 or 2, characterized in that the information includes the user identification, for instance, the name and/or customer number, and/or bank connection, for instance, the name of the banking institution, the bank code, and the account number, and/or the user's credit standing criteria, for instance, the credit worthiness, or a credit limit for the amount of money which is available for use, and/or accumulated revenues for the use or a use profile over a certain period.

4. Process, in accordance with any of the Claims 1 to 3, characterized in that all of the information can be changed prior to and/or during and/or after use. /7

5. Process, in accordance with any of the Claims 1 to 4, characterized in that the monetary amount is continuously reduced during use according to the way in which the telecommunications are used, and/or the distance of the telecommunications, and/or the duration of the use, and/or the currently applicable fee tariff.

6. Process, in accordance with any of the Claims 1 to 5, characterized in that the use is stopped if falling below a predefinable amount of money.

7. Process, in accordance with Claim 6, characterized in that the predefinable amount is zero.

8. Process, in accordance with any of the Claims 1 to 7, characterized in that the use is stopped after a predefined use has been incurred over a period, particularly, over one month.

9. Process, in accordance with any of the Claims 1 to 8, characterized in that the storage device works electronically and/or magnetically and/or optically.

10. Process, in accordance with any of the Claims 1 to 9, characterized in that the storage system is integrated in the telecommunications device.

11. Process, in accordance with any of the Claims 1 to 10, characterized in that the storage system can be extracted or detached from the telecommunications device.



12. Process, in accordance with any of the Claims 1 to 11, characterized in that the storage system is integrated in a microprocessor.

13. Process, in accordance with any of the Claims 1 to 12, characterized in that the changing of the information is carried out via a separate information carrier which can be made to communicate with the storage system.

14. Process, in accordance with Claim 13, characterized in that the information can be read out from the storage system via the information carrier.

15. Process, in accordance with Claim 13 or 14, characterized in that the information carrier is a chip card.

16. Process, in accordance with any of the Claims 13 to 15, characterized in that the information carrier is a magnetic strip card.

17. Process, in accordance with any of the Claims 13 to 16, characterized in that the information carrier works optically.

18. Process, in accordance with any of the Claims 1 to 17, characterized in that the storage system is a chip card.

19. Process, in accordance with any of the Claims 1 to 18, characterized in that the storage system is a magnetic strip card.

20. Process, in accordance with any of the Claims 1 to 19, characterized in that the information carrier and/or the storage system is or are integrated in a credit card, cash card, automatic teller machine card, calling card, or any PIN card.

21. Process, in accordance with any of the Claims 1 to 20, characterized in that the information carrier and/or the storage system is or are exchangeable for information carriers or storage systems of the same kind.

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22. Process, in accordance with any of the Claims 1 to 21, characterized in that the changing of the information in the information carrier and/or the storage system is carried out by means of a write-read unit which communicates with a financial institution.

23. Process, in accordance with Claim 22, characterized in that the write-read unit is an automatic teller machine.

24. Process, in accordance with Claim 22, characterized in that the write-read unit is integrated in the telecommunications device or assigned to it.

25. Process, in accordance with any of the Claims 22 to 24, characterized in that the write-read unit works electronically and/or magnetically and/or optically.

26. Process, in accordance with Claim 24, and, possibly, 25, characterized in that the write-read unit is extractable or detachable from the telecommunications device.

27. Process, in accordance with any of the Claims 1 to 26, characterized in that the telecommunications network is a decentrally organized network.

28. Process, in accordance with any of the Claims 1 to 27, characterized in that the fee-relevant information is decentrally generated or assessed by the telecommunications device.

29. Process, in accordance with any of the Claims 1 to 28, characterized in that the telecommunications device is a subscriber terminal.

30. Device for the assessment of fees for the use of a telecommunications network, particularly, of a mobile radio network, particularly, to carry out the process in accordance with any of the Patent Claims 1 to 29, with a telecommunications device, whereas the telecommunications device includes a storage system for fee-relevant information, particularly, concerning the amount of money which is available for the use, characterized in that, at least, the information pertaining to the amount of money can be changed prior to and/or during and/or after use.